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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/708,394 | 02/27/2004 | Yukio Koyanagi | 22040-00030-US | 2393 |

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CONNOLLY BOVE LODGE & HUTZ LLP
SUITE 800
1990 M STREET NW
WASHINGTON, DC  20036-3425

| EXAMINER |
|---|
| LAO, LUN S |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2644 | |

DATE MAILED: 07/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 10/708,394 | KOYANAGI, YUKIO |
| | Examiner | Art Unit |
| | Lun-See Lao | 2644 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on _02 June 2005_.
2a)☒ This action is **FINAL**.     2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) _1-14_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) _1-14_ is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☒ All   b)☐ Some *  c)☐ None of:
      1.☒ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

## DETAILED ACTION

### *Introduction*

1.     This action is responds to the amendment filed on 06-02-2005.  Claims 1, 5-7,

12, and 14 have been amended and claim 15 has been canceled.  Claims 1-14 are

pending.

### *Claim Rejections - 35 USC § 103*

2.     Claim1, 4-7 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Myers (US PAT. 4,817,149) in view of Wilkinson (JP 06-326555).

Consider 1 and 7  Myers teaches a filter device, comprising:

a first FIR filter (see fig.7, f1) for multiplying a signal of each tap of a tapped delay

line (see fig. 20) by several times according to given first filter factors and then

performing addition and output, the delay line being made up of a plurality of delay

units; and

a second FIR filter (FIG.7, F2) for multiplying a signal of each tap (FIG.20) of a

tapped delay line by several times according to given second filter factors and then

performing addition and output, the delay line being made up of a plurality of delay

units; wherein the first filter factors have a symmetrical sequence in which values are

set so that a sum is not zero (see col.8 lines 24-58 and col.13 line 35-col. 14 line 68), a

sum of every other term is equal to a sum of the other every other term with the same

signs (see figs. 1, 7, 20 and col. 13 line 35-col. 14 line 68); and the second filter factors

have a symmetrical sequence in which values are set so that a sum is zero (see fig.7 f2,

when the switch 110 connects to f1); but Myers does not clearly teach a sum of every other term is equal to a sum of the other every other term with opposite signs.

However, Wilkinson teaches a sum of every other term is equal to a sum of the other every other terms with the same signs (the first filter factor is composed of the ratios of -1, 0, 9,16, 9, 0, -1); and the second filter factors have a symmetrical sequence in which values are set so that a sum is zero and a sum of every other term is equal to a sum of the other every other terms with opposite signs (the second filter factor is composed of the ratios of 1,0, -9,16,-9,0,1 and see figs 5, 7 and col.5 lines 1-32).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Wilkinson into Myers to provide a half-band filter in respective low and high-band passing parts, placing the filters in an opposite stage and supplying the required symmetry.

Consider claims 12 and 14 Myers teaches a sound quality adjusting method, comprising:

a first filtering step, implemented by a first FIR filter (see fig.7, F1 and col. 8 lines 24-58), of multiplying a signal of each tap (see fig. 20),which delays an input sound signal, by several times by using first filter factors and then performing addition and output, the first filter factors having a symmetrical sequence in which values are set so that a sum is not zero and a sum of every other terms is equal to a sum of the other every other term with the same signs;(see col.8 line 24-58 and col. 13 line 35-col. 14 line 68), and

a second filtering step, implemented by a second FIR filter (see fig.7, F2 and col. 8 lines 24-58), of multiplying a signal of each tap of a tapped delay line (see fig. 20),

which delays an input sound signal, by several times by using second filter factors and then performing addition and output, the second filter factors having a symmetrical sequence are set so that a sum is zero (see fig.7 f2, when the switch 110 connects to f1)(see figs. 1,7,20 and col.8 line 24-58 and col. 13 line 35-col. 14 line 68);and

a gain controlling step (see fig.1, (200)) of controlling a gain of a sound signal having passed through the first FIR filter (see fig.7, f1) and a gain of a sound signal having passed through the second FIR filter (see fig.7, f2); and a summing step (see fig.1, 168) of summing the sound signals having undergone gain control in the gain controlling step and outputting a sum (see col.6 line 23-col. 7 line 47); but Myers does not clearly teach a sum in which values of every other term is equal to a sum of the other every other term with opposite signs.

However, Wilkinson teaches a sum of every other term is equal to a sum of the other every other terms with the same signs (the first filter factor is composed of the ratios of - 1, 0, 9,16, 9, 0, -1); and the second filter factors have a symmetrical sequence in which values are set so that a sum is zero and a sum of every other term is equal to a sum of the other every other term with opposite signs (the second filter factor is composed of the ratios of 1,0, -9,16, -9, 0, 1 and see figs 5, 7 and col.5 lines 1-32).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Wilkinson into Myers to provide a half-band filter in respective low and high-band passing parts, placing the filters in an opposite stage and supplying the required symmetry.

Consider claims 4,10,13 and11, Wilkinson teaches that the sound quality adjusting

device ofthe sequence of the first filter factors is composed of ratios of -1, 0, 9, 16, 9, 0,

and -1 and the sequence of the second filter factors is composed of ratios of 1, 0, -9,

16, -9, 0, and 1 (see fig.7 and page 5 lines 1-15) and the sound quality adjusting device

at least one of the first filter and the second filter is cascaded to a subsequent stage of

at least one of the first filter and the second filter (see fig.2 and page 1 lines 33-38).

Consider claim 5 Myers teaches that the sound quality adjusting device (see fig.1) of

the first FIR filter and the second FIR filter (see fig.7, f1, f2 and see col.8 line 24-58); but

Mayers does not teaches that at least one of the first FIR filter and the second FIR filter

is cascaded to a subsequent stage comprising a filter duplicating at least one of the first

FIR filter and the second FIR filter.

However, Wilkinson teaches that at least one of the first FIR filter (a symmetrical FIR

filter such as a pair of the low-pass filter and the high-pass filter (see specification

[0129])) and the second FIR filter (a symmetrical FIR filter such as a pair of the low-pass

filter and the high-pass filter (see specification [0129])) is cascaded to a subsequent

stage comprising a filter duplicating at least one of the first FIR filter and the second FIR

filter (see detailed page 1 [0004]-page 2 [0009]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time

the invention was made to combine the teaching of Wilkinson into Myers to provide a

half-band filter in respective low and high-band passing parts, placing the filters in an

opposite stage and supplying the required symmetry.

Consider claim 6 Myers teaches that the sound quality adjusting device (see fig.1) of the first FIR filter and the second FIR filter (see fig.7, f1, f2 and col. 8 line 24-58) and the control is performed on a gain (see fig.1, 200) of an output signal from each of the cascaded FIR filters (see fig.7, f1, f2) in the subsequent stage, and sound signals having been subjected to gain control are summed and outputted (see fig. 1 and see col. 6 line 23-col. 7 line 47), but Myers does not clearly teach that the first FIR filter and the second FIR filter is cascade in parallel to a subsequent stage comprising first FIR filter, the first FIR filter and second FIR filter being cascaded in the parallel to a subsequent stage of the second FIR filter.

However, Wilkinson teaches that the first FIR filter (a symmetrical FIR filter such as a pair of the low-pass filter and the high-pass filter (see specification [0129])) and the second FIR filter (a symmetrical FIR filter such as a pair of the low-pass filter and the high-pass filter (see specification [0129])) is cascade (see fig. 2) in parallel to a subsequent stage comprising first FIR filter, the first FIR filter and second FIR filter being cascaded in the parallel to a subsequent stage of the second FIR filter (see detailed page 1 [0004]-page 2 [0009]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Wilkinson into Myers to provide a half-band filter in respective low and high-band passing parts, placing the filters in an opposite stage and supplying the required symmetry.

3.    Claims 2-3 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Myers (US PAT. 4,817,149) as modified by Wilkinson (JP 06-326555) as applied to

claims 1 and 7 above, and further in view of Kovtun (US PAT. 6,512,944)

Consider claims 2, 8 and 3,9, Wilkinson teaches the sound quality adjusting device

of the second filter factors, signs of values other than a median of the sequence of the

first filter factors are changed while causing values of the sequence to remain the same

(see fig. 7 and detailed description page 4 [ 0022]- page5 [0020]); and the sound quality

adjusting device of the second filter factors, signs of values other than a median of the

sequence of the first filter factors are changed while causing values of the sequence to

remain the same (see fig. 7 and detailed description page 4 [ 0022]- page5 [0020]); but

Wilkinson does not clearly teach the causing absolute values of the sequence to remain

the same; and the median of the sequence is subtracted from a reference value.

However, Kovtun teaches the causing absolute values (see scale factor formula

col.5, line 1-15) of the sequence to remain the same, and the median of the sequence is

subtracted (fig.2, 34) from a reference value (see figs1-6 col. 4 line 14-col. 5 line 51)

Therefore, it would have been obvious to one of ordinary skill in the art at the time

the invention was made to combine the teaching of Kovtun into the teaching of

Wilkinson and Myers to provide an improved, low-pass filter capable of removing noise

signal component from higher frequency signal.

4.    Claims 2-3 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Myers (US PAT. 4,817,149) as modified by Wilkinson (JP 06-326555) as applied to

claims 1 and 7 above, and further in view of Honma (US PAT. 6,512,944).

Consider claims 2, 8 and 3,9, Wilkinson teaches the sound quality adjusting device

of the second filter factors, signs of values other than a median of the sequence of the

first filter factors are changed while causing values of the sequence to remain the same

(see fig. 7 and detailed description page 4 [ 0022]- page5 [0020]); and the sound quality

adjusting device of the second filter factors, signs of values other than a median of the

sequence of the first filter factors are changed while causing values of the sequence to

remain the same (see fig. 7 and detailed description page 4 [ 0022]- page5 [0020]);

Wilkinson does not clearly teach the causing absolute values of the sequence to remain

the same; and the median of the sequence is subtracted  from a reference value.

However, Honma teaches the causing absolute values of the sequence to remain

the same (by the controller 14, and see fig. 1); and the median of the sequence is

subtracted from a reference value (see fig.1 and col.6 line 61-col.8 line10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time

the invention was made to combine the teaching of Honma into the teaching of

Wilkinson and Myers to provide an amplitude of a digital signal output is converged

quickly and securely to a predetermined value, thereby obtaining a reception output with

a multipath component eliminated therefrom.

### *Response to Arguments*

5.   Applicant's arguments with respect to claim1-14 have been considered but are

moot in view of the new ground(s) of rejection.


### *Conclusion*

6.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action.  Accordingly, **THIS ACTION IS MADE FINAL**.  See MPEP

§ 706.07(a).  Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action.  In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action.  In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.


7.     The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.  Cho (US PAT. 5,418,859) is recited to show other related the

sound quality adjusting device and filter device used therefor, sound quality adjusting

method, and filter designing method.

8.        Any response to this action should be mailed to:

          Mail Stop ____(explanation, e.g., Amendment or After-final, etc.)

          Commissioner for Patents
          P.O. Box 1450
          Alexandria, VA 22313-1450
          Facsimile responses should be faxed to:
          **(703) 872-9306**
          Hand-delivered responses should be brought to:
          Customer Service Window
          Randolph Building
          401 Dulany Street
          Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Lao,Lun-See whose telephone number is (571) 272-7501  The examiner

can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chin Vivian, can be reached on (571) 272-7848.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Lao,Lun-See
Patent Examiner
US Patent and Trademark Office
Knox
571-272-7501
Date 07-15-2005

VIVIAN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600